

gasys seem not to have developed Ritualistic tendencies ; but they have advanced notions concerning ornament, bright colours look especially well on a brown skin, and possibly before long a Malagasy bishop may appear in full Ritualistic fig, evolved out of his inner consciousness. If so, may we be there to see.

We have only been able to touch here and there on the many interesting subjects discussed by Mr. Sibree. This book is a most valuable addition to knowledge and very entertaining. It contains several full-page illustrations (not all new) and two maps.

#### CLAUSIUS'S "MECHANICAL THEORY OF HEAT"

*The Mechanical Theory of Heat.* By R. Clausius. Translated by W. R. Browne, M.A. (London : Macmillan and Co.)

THIS translation satisfies a real want of a tolerably large class of students of science. It furnishes in a volume of reasonable size a clear and readable account of a subject, an acquaintance with which has until lately been only obtainable by an English reader at the cost of a great deal of research through the transactions and memoirs of various societies. The name of its author furnishes a sufficient guarantee of the accuracy of the substance matter of the book, treating as it does of a subject specially his own. The method of treatment leaves hardly anything to be desired, even from the point of view of a student previously ignorant of the subject. The reader is nowhere perplexed by uncouth symbols or analytical operations beyond those which are familiar to all acquainted with the principles of the differential and integral calculus. At the same time, and perhaps partly in consequence of this avoidance of complicated analysis, the reader is never allowed to lose sight of the essential meaning of the symbols employed. Some of the chapters in the book will furnish a valuable exercise in the meaning and value of partial differential coefficients, even to a student who is not specially interested in the physical questions discussed. The same remark applies to some of the explanations given in the mathematical introduction, on the nature of the integral of a total differential in the case when the condition of being an exact differential is not fulfilled, explanations originally inserted, as the author tells us, in consequence of objections made to his theory by Prof. Decher.

Any one wishing to gain a general acquaintance, thorough as far as it goes, with the subject, can scarcely do so with the expenditure of less time and labour than are required for the perusal of this book. As a mathematical study the book may replace some of the luxuriant growths of modern geometry and analysis with great advantage to the brains of the student.

The translation is admirably done. It is hardly possible in reading it to recognise any traces of foreign idiom. Occasionally we find some little confusion of phraseology, probably arising from loose translation ; as on page 210, where a rather curious description is given of the ordinary process of changing the independent variables from  $x, y$ , to  $\xi, \eta$ , and this process is apparently

referred to, a little lower down, as an "artifice." It is a pity, too, and a little surprising, considering the array of scientific talent mentioned in the preface as having been applied to the correction of first proofs, that the book should be disfigured by so many misprints. Not to speak of great uncertainty as to the insertion or omission of a comma between the two variables inside a bracket after a functional symbol, and the sign  $\times$  between two factors of a product, there are many serious errors. Thus, for instance, on page 69 we have "volumes" for "values:" on pages 117 and 124 we have the sign  $+$  for  $\times$  ; on page 187 we have  $dT$  for  $T$ . In equations (19) and (20) of page 190 we have  $\frac{dQ}{dT}$

written instead of  $\frac{dQ}{dP}$ , and the error is repeated twice

lower down on the same page. The figure of the steam-engine on page 237, described as an "imaginary one," certainly strikes one as decidedly imaginary. The insertion of a few valves in the figure at suitable places would render it more satisfactory, at any rate to an unimaginative reader. It may be hoped that these blemishes will be removed when a second edition is reached of what, in spite of them, is an exceedingly valuable addition to our English mathematical literature. W. S. A.

#### OUR BOOK SHELF

*Noxious and Beneficial Insects of the State of Illinois. Third Annual Report.* By Cyrus Thomas, State Entomologist. Pp. 1-212. 8vo. (Springfield, 1879)

If we might be permitted to propose another title for this book, we would suggest that of "An Essay towards a Monograph of North American *Aphides*." But we fancy such a title would be too much opposed to that borne on the cover. We fear the Report is too profound to be of service to agriculturists and horticulturists, otherwise than on the same grounds that an intelligent mother of a family is enabled, from the study of a medical dictionary (intended for the use of the profession only), to diagnose the symptoms of measles, croup, and other ills that infantine humanity is heir to. We might make the same objection to the titles of a multitude of American *scientific* publications. The axiom that "the end justifies the means" scarcely needs being called into requisition in a notice of this Report ; yet some uncertainty exists in our mind as to the end aimed at. Does it consist in enabling unscientific, but intelligent, farmers and horticulturists to identify their plant-lice foes? or is it intended as a prominent contribution towards a knowledge of these insects, to be made use of by scientific workers principally? We do not attempt to solve the problem, but prefer to regard the Report more especially in the last-named light.

Looking, then, at the scientific side of the question, we see here a most valuable contribution to a natural history of American *Aphides*, and in some respects we think it would have been better had the author not been hampered with the necessity of producing a popular report at the same time. It is impossible to give an analysis of the author's views on the many vexed questions in the life-cycles of these noxious atoms. Much of the introductory remarks on habits has been of necessity (and advisedly) compiled, and the suggestions as to dimorphism (p. 31) have, we think, been somewhat fully anticipated ; still there remain some very potent suggestions made by Dr. Thomas ; not the least of which is in what form those species that appear habitually to attack *annual* plants only, pass the winter months?

A multitude of new species are described, and others already noticed have been more fully investigated and the details given. Naturally, many European species occur also in America. For these the author has mainly (as is acknowledged) made use of Mr. Buckton's yet incomplete monograph of the British species, adopting also the latter author's somewhat unscientific form of bibliographical and synonymic quotation. Some very glaring typographical errors are corrected, but only in the place where they first occur, although constantly recurring; others almost equally important are not noticed.

*Zur Kenntniss der Fauna des untersten Lias in den Nordalpen.* Von Dr. Neumayer. (Vienna, 1879.)

ENGLISH geologists who are interested in the study of the Infralias, will welcome this latest contribution to science by the indefatigable palæontologist of Vienna. The fossils described have been obtained principally from three localities—Pfonsjoch, in the Northern Tyrol, Breitenberg, in the Osterhorn group, and Zlambach in the Traunthale. Among the sixty-six forms here noticed, a large proportion are either identical with species which have been described in Western Europe or present such slight points of difference that Dr. Neumayer has not felt himself warranted in giving them distinct names. It is very interesting to find how close is the agreement in the general characters of the fossils of these Infralias beds in the Mediterranean province with the fauna of the strata on the same horizon in England, France, and Swabia. As in Western Europe, so in the Alpine province, we find the numerous varieties of *Ammonites (Aegoceras) angulatus* and *planorbis*, especially characterising the zone by their great abundance; while *Ostrea arietis*, *Lima punctata*, *L. gigantea*, *L. succincta*, *Modiola psilonoti*, *Myoconcha psilonoti*, and *Unicardium cardioides*, are associated with these ammonites in both areas. Besides these familiar forms there occur, however, some others which are quite unknown in Western Europe. Dr. Neumayer's monograph is illustrated with seven well-executed lithographic plates, and is a very valuable contribution to our knowledge of the Jurassic formation in the Alps.

J. W. J.

*Africa Past and Present.* By an Old Resident. (London: Hodder and Stoughton, 1879.)

IN "Africa Past and Present" the writer carries us back to the time when Herodotus, collecting material for his history, in the absence of written documents, travelled to Africa. Then follow chapters on enterprising Arabs, who penetrated into the interior of the country at a far distant period, and on the Portuguese early English and French discoveries. Accounts are given of the travellers who were sent out by the African Association to explore the interior of the country, prominent among whom were Mungo Park, "whose melancholy fate did not damp the ardent desire of the British public for further information concerning the interior of the great continent." Then follow descriptions of the more recent adventures and discoveries of Speke, Grant, Baker, Livingstone, and others, though the author makes no reference to the important work done by recent German explorers. The latter half of the book is devoted to the history and physical geography of the country, the author taking each division and giving topographical details of it, and speaking of its climate, resources, productions, and character, manners, and social condition of its inhabitants. The book is intended as a handbook for missionaries, merchants, travellers, and emigrants who wish for information about Africa. As such it will be useful. The book has many illustrations and a map of the country. It has also the advantage of being cheap and portable.

## LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

### Ice-Crystals

I HAVE been prevented by other work from thanking your correspondents who offered explanations of the peculiar forms taken by ice-crystals upon rotten ligneous fibre.

Will you, however, allow me to say that the explanation offered is one respecting which I am very sceptical.

That explanation is that the long filaments, like spun glass, are merely the result of the internal freezing of the moisture in the substance of the wood and of the expansive force of that freezing pressing the ice thus formed through the pores of the wood.

My impression is that if this were the cause the expansive force would be sufficient to destroy the ligneous fibre altogether, and break it up. I question also whether there are any pores or tubes of the kind and size required by this theory running in the direction of the medullary rays. Lastly, as upright arborescent forms of ice-crystal are formed upon dry wood and upon other substances, which cannot possibly be due to any such cause, I am inclined to think that this particular form is determined by some other cause than the one suggested. The filaments are much too long and much too crystalline in structure to be the mere result of extrusion from an internal mass of ice.

Argyll Lodge, Kensington, February 14

ARGYLL

### Koenig's Collection at the Philadelphia Exhibition

MY attention has just been drawn to the fact that a report has recently been circulated in London to the effect that the splendid collection of acoustic apparatus exhibited by Koenig, of Paris, at the Centennial Exhibition of 1876, had been retained in this country for the Stevens Institute of Technology, under promise of payment, and that nothing had been paid for it.

As regards the Stevens Institute, I have to say that the report is utterly without foundation.

We have never had one of the instruments in our charge, nor has a word ever been said about purchasing it for our use.

The collection was, in fact, removed from the Centennial building to the University of Pennsylvania at Philadelphia, which is about one hundred miles from here, where it now remains, and it has been currently reported that a gentleman in Philadelphia had presented it to the said University. As to that part of the story I know nothing, but I do know absolutely that the Stevens Institute of Technology has never had anything directly or indirectly to do with the matter.

HENRY MORTON

Stevens Institute of Technology, Hoboken, New Jersey,  
February 4

### "Scientific Jokes"

I DO not know who your correspondent "G. H." may be, but I should surmise from the tone of his letter that he is somewhat of a beginner in science, and that he is so proud of his acquaintance with certain elementary propositions in thermodynamics, that he is on the *qui vive* to detect in others an ignorance of them. In my opinion the fair meaning of the passage objected to, when read with its context, is that the author is drawing a parallel between temperature in heat and potential in electricity (between which there are striking analogies), and that the words to which your correspondent refers are purposely employed to prevent any one imagining (as "G. H." seems to have done) that it was intended to represent the energy of heat as the *product* of heat and temperature in the same manner as that of electricity is the product of quantity and potential. Temperature is treated as inseparable from heat and nothing more, just as potential is inseparable from electricity, and this is not an unscientific view of the matter.

The latter part of the letter relating to the theory of terrestrial magnetism, propounded by Professors Ayrton and Perry, is, I